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(54) THE DATA STREAMING APPARATUS AND METHOD FOR DIGITAL DATABROADCASTING SERVICE

Abstract

Machine Translation

1. The technical field in which the invention in claims belongs. The present invention relates to data streaming apparatus for the digital databroadcasting service and method. 2. The technical problem which an invention tries to solve. As to the present invention, when the part for data broadcasting encapsulates data contents to data broadcasting transfer protocol, at the same time, it is able to assist a plurality of international data broadcasting transmission standards. The part tries to provide the computerlegiable medium which multiplexes data types of the different type and in which the part records data streaming apparatus, for together transmitting data contents the method and the program for realizing a method in the video / audio manufactured to the existing national television system committee. 3. The gist of the solution of an invention. The present invention, is data streaming apparatus for the digital data broadcasting includes the clock treatment means which stores multimedia data according to the supplementary data transfer request through the external Interface for the supplementary data electrical transmission with the control signal of the system control means: system control means controlling data streaming process; it checks the transmission error of data inputted with the control signal of the supplementary data presentation means: system control means multiplexing the stored data as described above and transmitted from the supplementary data presentation means; it analyzes data; and it has the system clock or the PCR (Program Clock Reference) of data broadcast transmission system as an input and data broadcast protocol encapsulant means provides the base time with the control signal of the system control means and the multiplexer which multiplexes the transport stream packet inputted from data broadcast protocol encapsulant means with the control signal of data broadcast protocol encapsulant means: system control means

encapsulating data inputted from the supplementary data analysing mean to the international standard transfer protocol with the control signal of the supplementary data analysing mean: system control means delivering the analysis consequence information and data and which delivers in consideration of the transmission priority and buffer model to one transport stream and outputted for a synchronization between the motive of data stream and a stream. 4. The important use of an invention. The present invention is used for the interactive multimedia broadcasting.

Human Translation

PURPOSE: A device of streaming data for a digital data broadcasting service is provided to simultaneously support international data broadcasting transmission standards when encapsulating additional data contents to a data broadcasting transmission protocol, and to multiplex many data types, thereby simultaneously transmitting the additional data contents.

CONSTITUTION: A system controller(25) controls a data streaming process for additional data transmitting. An additional data supplier(21) stores multimedia data by a control signal of a system controller, and multiplexes the stored data to transmit the data. An additional data analyzer(22) checks a transmission error of data inputted from the additional data supplier by the control signal, and analyzes the data to transmit analyzed result information and the data. A data broadcasting protocol encapsulator(23) encapsulates the inputted data to an international standard transmission protocol, and transmits the encapsulated data. A multiplexer(24) multiplexes a transmission stream packet as one transmission stream in consideration of transmission priority and a buffer model. A clock processor(26) inputs a system clock or a PCR(Program Clock Reference) of a data broadcasting transmission system, for synchronization of a data stream and a stream synchronization, and supplies a reference time.

Fig. 2

The data streaming, PSIP, ATSC, DVB, MPEG -2.

Descritption

Brief explanation of the drawing

2 Fig. 1 is a configuration example diagram of data broadcast transmission system in which the present invention is applied to.

3 Fig. 2 is an example construct drawing of data streaming apparatus for the digital databroadcasting service according to the present invention.

4 Fig. 3 is an execution example processing flow char about data streaming method for the digital databroadcasting service according to the present invention.

5 Fig. 4 is one preferred embodiment detail flow chart about the transport stream packet multiplexing procedure among data streaming method according to the present invention.

6 * The description of reference numerals of the main elements in drawings.

7 21: supplementary data offer part 22: supplementary data analysis section.

8 23: data broadcast protocol encapsulation.

9 24: multiplexer 25: system controller.

10 26: clock processor.

- Details of the Invention
- Purpose of the Invention

The Technical Field to which the Invention Belongs and the Prior Art in that Filed

11 The present invention relates to the thing about the computerlegiable medium recording data streaming apparatus for the digital databroadcasting service and method and the program for realizing a method.

12 There is a problem that in the conventional digital television broadcasting, an inter-compatibility does not have as to the system, transmitting the additional information contents between receivers which receive the different data broadcasting service because of using the transfer protocol which data broadcasters defines for its own.

13 In the meantime, there is a problem that it was made in the standardization for data broadcasting service is the ATSC (Advanced Television Systems Committee) in U.S, the DVB (Digital Video Broadcasting) in Europe, and the ISDB- T (Terrestrial Integrated Services Digital Broadcasting) in the Japanese etc in order to solve this and the standard about data broadcasting transfer protocol was instituted. It is not facilitated to build the actual system with reference to the model because it presented the system model comprised for data broadcasting system implementation of different feature modules in each boiler but each system models are conceptually defined.

14 Moreover, it is required to design a system in order to comprise a system in order to produce the stream for data broadcasting service of a plurality of international standards in one system because the transmission scheme of data broadcasting transfer protocol described in the above be very similar and it is altogether satisfied a plurality of international standards.

15 Moreover, in each data broadcasting standard, the system which is a multiplex and efficiently transmits these because of defining each transfer protocol toward data of the different type is requested.

Technical challenges of the Invention

16 It are an object of the present invention to provide the computerlegiable medium it is proposed in order to solve a problem as described above, and when the part for data broadcasting encapsulates data contents to data broadcasting transfer protocol, which at the same time, is able to assist a plurality of international data broadcasting transmission standards, and it multiplexes data types of the different type and in which the part records data streaming apparatus, for together transmitting data contents the method and the program for realizing a method in the video / audio manufactured to the existing national television system committee.

- Structure & Operation of the Invention

17 A purpose is accomplished. And the present invention is to be equipped with the clock treatment means which stores

multimedia data as to data streaming apparatus for the digital data broadcasting according to the supplementary data transfer request through the external Interface for the supplementary data electrical transmission with the control signal of the system control means: system control means controlling data streaming process, and it checks the transmission error of data inputted with the control signal of the supplementary data presentation means: system control means multiplexing the stored data as described above and transmitted from the supplementary data presentation means, and it analyzes data, and it has the system clock or the PCR (Program Clock Reference) of data broadcast transmission system as an input and data broadcast protocol encapsulant means provides the base time with the control signal of the system control means and the multiplexer which multiplexes the transport stream packet inputted from data broadcast protocol encapsulant means with the control signal of data broadcast protocol encapsulant means: system control means encapsulating data inputted from the supplementary data analysing mean to the international standard transfer protocol with the control signal of the supplementary data analysing mean: system control means delivering the analysis consequence information and data and which delivers in consideration of the transmission priority and buffer model to one transport stream and outputted for a synchronization between the motive of data stream and a stream.

18 In the meantime, the present invention is to be equipped with the third step: which produces the transport stream packet it produces the service information table it encapsulates the first step: second step: multiplexed multimedia data as described above which decides data broadcasting transfer protocol it analyzes the multiplexed multimedia data as described above to the protocol determined on the second step multiplexes multimedia data which it transmits it receives the request to send and transmission schedule information of multimedia data according to the transmission rate a system is initialized as to data streaming method for being applied to data streaming apparatus for the digital data broadcasting and the fourth stage which multiplexes the generated transport stream packet as described above in consideration of the transmission priority and buffer model to one transport stream and outputted.

19 In the meantime, the present invention is to provide the computerlegiable medium which if a system is initialized in data streaming apparatus equipped with a processor, records the program for realizing the third function: of encapsulating the first function: second function: multiplexed multimedia data as described above of analyzing the multiplexed multimedia data as described above and deciding data broadcasting transfer protocol to the protocol determined with the second function and of multiplexing multimedia data which receives the request to send and transmission schedule information of multimedia data and which transmits according to the transmission rate producing the service information table and the transport stream packet and the fourth function of multiplexing the generated transport stream packet as described above in consideration of the transmission priority and buffer model to one transport stream and outputing.

20 The above-described purpose, and the features and advantage are evident than the detailed description relating with the attached drawing. Below, and the attached desirable embodiment are circumstantially illustrated.

21 Fig. 1 is a configuration example diagram of data broadcast transmission system in which the present invention is applied to.

22 As shown in
Fig. 1, data broadcast transmission system provides data streaming apparatus (11), the video / audio payload pary (12), the video/audio encoder (13), the program multiplexer (14), PSIP (Program and System Information Protocol for terrestrial broadcast and cable) / SI (Service Information) generator (15), the remultiplexer (16) and broadcasting part (17).

23 Next, if a configuration and the concrete operation of each element are little more circumstantially looked into, it is the same as that of the next time.

24 As to data streaming apparatus (11), after having multimedia data of all types including static images, moving picture, and a text etc as supplementary data and dividing data into the block of the determined size according to the transmission schedule information, it multiplexes this and it transmits with the program multiplexer (14) and remultiplexer (16). The block does the function of controlling the PSIP / SI generator (15) according to that.

25 And the video / audio contents is stored. It does the function of transmitting the video / audio contents stored for the video / audio compression with the video/audio encoder (13).

26 And the video/audio encoder (13) is comprised of the audio encoder compressioning code the audio stream according to the video encoder producing the video stream which compressions code according to the MPEG -2 standard and MPEG-2 advanced audio coding standard or the AC (Audio Cording) -3 standard. And after being delivered the video / audio contents in the video / audio saving means (12) and compressioning code, it does the function of delivering to the program multiplexer (14).

27 And the program multiplexer (14) packetizes the video / audio stream which is compression coded through the video/audio encoder (13) to the PES (Packetized Elementary Stream). While producing the PSI (Program Specific Information), it multiplexes the generic functionality, of packetizing and the supplementary data transport stream packet inputted to data streaming apparatus (11) these to the transport stream packet (TS : Transport Stream) with the video / audio transport stream packet and it produces one transport stream (TS) and these have the additional function of transmitting with the remultiplexer (16).

28 And according to a control from data streaming apparatus (11) for the program guide of the digital data broadcasting, the PSIP / SI generator (15) produces the PSIP table of ATSC and SI table of DVB and it has the function of transmitting with the remultiplexer (16).

29 And according to the MPEG -2 system specification from the inputted different transport stream, the remultiplexer (16) reconstructs the PSIP / SI / PSI. It reassigns the PID (Packet Identifier). And it modifies the PCR (Program Clock Reference) and it delivers the transport stream to the broadcasting part (17).

30 And as to the broadcasting part (17), in order to transmit the transport stream outputted in the remultiplexer (16) with the air radio frequency, it has the function of modulating and transmitting to the satellite wave or the ground wave.

31 Fig. 2 is an example construct drawing of data streaming apparatus for the digital databroadcasting service according to the present invention.

32 As shown in
Fig. 2, data streaming apparatus (11) provides the supplementary data offer part (21), the supplementary data analysis section (22), data broadcast protocol encapsulation (23), the multiplexer (24), the system controller (25) and clock processor (26).

33 Next, if a configuration and the concrete operation of each element are little more circumstantially looked into, it is the same as that of the next time.

34 The supplementary data offer part (21) provides the function for this, of storing supplementary data it transmits it multiplexes supplementary data according to the transfer request of supplementary data from the system controller (25) and the function of multiplexing data.

35 Firstly, the function of storing supplementary data performs through the method for having the database which all datas which can be used for data broadcasting service are stored or data which can be used for data broadcasting service being received from an outside and storing. And the function of multiplexing data multiplexes stored supplementary data according to the transmission rate.

36 And the supplementary data analysis section (22) provides the function receiving data sent in the supplementary data offer part (21) and processing, and of analyzing with the function for this, of receiving data. The function of receiving data inspects the error of data delivered from the supplementary data offer part (21) and if an error is discovered, it requires retransmitting and if the function of receiving data does not have an error, it stores data according to a type in the respective allocated buffer. And the function of analyzing data is delivered from the supplementary data offer part (21) and it analyzes data stored in a buffer and it analyzes the information which it confronts if data of any kind of kind was input.

37 In data inputted with the supplementary data analysis section (22) from the supplementary data storage (21) of data streaming apparatus (11), if the meta information like data type, module ID (ModuleID), the block number, the block size, the PTS (Presentation Time Stamp), the PTS extension, the CRC (cyclic redundancy check) etc being included but the supplementary data storage (21) multiplexing data, the module ID being assigned according to each data type and dividing one data into the different block, the block number is assigned and the block size is set up, the type of data inputted from the supplementary data analysis section (22) is recognized in data broadcast protocol encapsulation (23) and each data block is encapsulated to any kind of protocol, it can determine. Moreover, when encapsulating to the transfer protocol in case of being data synchronized with the motive /, PTS and the necessary PTS extension information are contained and the field of CRC is added to data packet final stage for the error detection of data.

38 And data broadcast protocol encapsulation (23) encapsulates data sent in the supplementary data analysis section (22) to the international standard transfer protocol and it performs the function of delivering to the multiplexer (24). The data broadcast protocol encapsulation (23) for the performance of a function provides the thing performing the function, of producing the system information the function of encapsulating supplementary data to the transfer protocol and the function of packetizing the supplementary data section and PES to the MPEG-2 transport stream.

39 Here, data broadcast protocol encapsulation (23) performs the function of producing the system information. In that way it produces the program information which a user defines so that the receiving device of data broadcasting receive the program having within the MPEG-2 transport stream. The program information is the PAT (Program Association Table) of PSI, the table for the PMT (Program Map Table) and data broadcasting etc.

40 Moreover, data broadcast protocol encapsulation (23) performs the function of encapsulating supplementary data to the transfer protocol. In that way synchronized asynchronous streaming data or bistrimming data encapsulates to DSM- CC (Digital Storage Media Command and Control) section of the international data broadcasting standard. The IP (Internet Protocol) datagram encapsulates the MAC (Multimedia Access Control) address to the private section included. And streaming data synchronized with motive streaming data encapsulates to the MPEG-2 PES. At this time, time code fields of the MPEG-2 PES packet header receive the reference clock from the clock processor (26) and it is coded.

41 Moreover, data broadcast protocol encapsulation (23) performs the function of packetizing to the MPEG-2 transport stream. In that way by having the PES packet or each section data as an input and adhering the MPEG -2 transport stream packet header to these it produces the MPEG -2 transport stream packet. That is, the PES packet of streaming data, synchronized with the motive / section data, and the table for the PSI table and data broadcasting are packetized to each MPEG-2 transport stream. Moreover, in the multiplexer (24), the necessary null packet is produced to multiplex in order to satisfy with the CBR (Constant Bit Rate) and freight bit string system target decoder (T-STD) buffer model.

42 And the multiplexer (24) multiplexes each MPEG -2 transport stream packet which is input from data broadcast protocol encapsulation (23) according to the transmission priority of a packet to one MPEG-2 transport stream and it performs the program multiplexer (14) or the function of delivering to the remultiplexer (16). And the function is generated the freight bit string of the fixing transmission rate using moreover, the null packet.

43 Moreover, in the multiplexer (24), by checking the state of the buffer in which each input mpeg -2 transport stream packet is stored whether or not is inspected whether the electrical transmission of a packet is possible. Each MPEG -2 transport stream packet is transmitted with the transport stream of the CBR form according to the transmission priority with the program multiplexer (14) or the remultiplexer (16) when a buffer was activated. And the timing for periodically transmitting PSI, PCR, and the null packet is detected. And it inspects whether the electrical transmission at the next packet transmission time interval is possible.

44 And in order to transmit data to especially have to transmit with each time slot according to the transmission schedule information which the system controller (25) defines it controls data stored in the supplementary data offer part (21). When data being input from the supplementary data offer part (21), data have and it watches whether the supplementary data analysis section (22) operates. The transmission schedule information includes each data transfer rate, data communications method, and the transmitted data name, data type, the module Identification, the block number, the block size, PTS, the PTS extension, CRC etc. And the transmission schedule information is comprised of information required for data service.

45 Moreover, as to the system controller (25), data broadcast protocol encapsulation (23) uses any kind of data broadcasting transmission standard, it indicates. In order to if data broadcast protocol encapsulation (23) uses the ATSC data broadcasting transmission standard, it uses the PSIP table and if it uses the DVB data broadcasting transmission standard, it produces the SI table and it transmits with the remultiplexer (16) it controls the PSIP / SI generator (15).

46 Moreover, as to the system controller (25), it controls the transmission priority, the transport stream output factor and output directivity (for exemple, the program multiplexer (14) direction or the remultiplexer (16) direction) when the multiplexer (24) multiplexes the transport stream packet. In order to insert data transport stream packet which is input to the program multiplexer (14) from the multiplexer (24) into a video and audio transport stream it controls.

47 Moreover, as to the system controller (25), it indicates if the clock processor (26) receives the system clock or PCR as the input signal.

48 And the clock processor (26) performs the function the PCR value generated in the program multiplexer (14) from the clock used or the program multiplexer (14) multiplexing the mpeg-2 video / audio and prints out one MPEG-2 transport stream is input in order to extract the necessary time information in the timecoding of the MPEG-2 PES and of transmitting the sync control signal with data broadcast protocol encapsulation (23).

49 Fig. 3 is an execution example processing flow char about data streaming method for the digital databroadcasting service according to the present invention.

50 Firstly, as to data streaming apparatus, if the power source is applied and data broadcast transmission system runs, the power source does about the variable of each functional unit with the initialization (301).

51 As to the initialized data streaming apparatus, after sticking the meta information of data type, module ID, block number, block size, PTS, the PTS extension, CRC etc which divides specific datas stored in the supplementary data offer part (21) into the different block if the transmission rate of the datas is inputted through the system controller (25) and recognizes data block and datas which desire that a user transmits data transmission requirement and transmission schedule information through the external Interface among the reception (302), and data stored in the supplementary data offer part (21), it does according to the transmission rate of each datas with the multiplex (303) and it is done by one data stream in the supplementary data analysis section with the electrical transmission (304).

52 At this time, in the supplementary data offer part (21) for the multiplex (303), data for to transmitting are selected according to the transmission schedule information of multimedia data. The selected data as described above is divided into the block of the size defined within the transmission schedule information. And the divided data block as described above is multiplexed in the divided data block as described above according to transmission rate allocated to each data adding the meta information, and is defined within the transmission schedule information.

53 In the supplementary data analysis section (22) data multiplexed as described above, CRC of data block is done about through the analysis with the investigation (305) whether it has the error of each block datas or not. The retransmiossion of data is requested if it has the investigation result error. It stores in a buffer if it does not have an error. The reset information which has to encapsulate, is inputted to any kind of data broadcasting transmission standard from the system controller (25) is analyzed or the header of data stored in a buffer is analyzed and data stored in a buffer are done with the crystallization (306).

54 If the PSI / SDF (Service Description Framework) table (308) is to the DVB (Digital Video Broadcasting) data broadcasting transmission standard the encapsulation (309) if it is done by the ATSC (Advanced Television Systems Committee) data broadcasting transmission standard with the encapsulation (307), the PSI / SI (Service Information) table (310) is produced.

55 Moreover, it does with the investigation (311) whether it is data in which encapsulated data are synchronized to data broadcasting transmission standard described in the above with the motive /. If it is data in which investigation result data is

synchronized with the motive /, it is done by the MPEG-2 PES with the encapsulation (312) and the MPEG -2 transport stream packet is the production (313). At this time, the necessary synchronizing signal receives an input from the clock processor (26) and it time codes and produces the PTS / DTS (Decoding Time Stamp). Moreover, if it is not data synchronized with the investigation result motive /, the MPEG -2 transport stream packet is directly the production (313).

56 In the above case, it has generated MPEG -2 transport stream packets as one MPEG-2 transport stream through the multiplex considering the transmission priority and buffer model with the electrical transmission (314).

57 [Table 1] As to data streaming method according to the silver the present invention, it is the desirable embodiment about the priority transmitting the MPEG -2 transport stream packet.

58 The respective made MPEG -2 transport stream packet is transmitted according to the transmission priority in order to produce the MPEG-2 transport stream. It sets up in a desirable preferred embodiment of the present invention, in order to transmit with the transmission priority like [table 1].

Table 1

Transmission priority	TS packet
1	PCR
2	PSI(PAT,PMT)
3	The SDF (DST,NRT) or SI
4	The synchronized data stream
5	Synchronous data stream
6	IP datagram (Datagram)
7	Asynchronous data (Non-flow Controlled Scenario)
8	Asynchronous data (Data Carousel Scenario)
9	Null packet (Null Packet)

59 In [table 1], since it is necessary to have that the timing information arrives to the fixed time interval without the PCR jitter in order to reproduce stream data, the transmission priority is most high about the PCR MPEG -2 transport stream packet. Since it has the transfer period which the necessary tables for data broadcasting define in the MPEG -2 system specification and data broadcasting standard in order to reproduce data transmitted with PSI tables which respect that data broadcasting receiver receives the MPEG-2 transport stream and it does the inverse multiplexing and describe the information like PID about necessary each data in the specific application of data broadcasting receiver, the transmission priority is higher than data.

60 And since synchronized stream data respects the motive which is strict with the other stream and the priority has to be the highest among data and synchronous stream data has to transmit data of the predetermined amount in the fixed time in order to be consecutively,sequentially,serially reproduced in a receiver, the priority is higher than asynchronous data. Immediately since to reacting to the demand when demanding the IP datagram with the user needs, the transmission priority is higher than asynchronous data about the IP datagram.

61 And as to asynchronous data which it periodically sends among asynchronous data, since being periodically continuously stored in the buffer of a receiver and receiving desired data, the transmission priority has to be higher than asynchronous data which asynchronous data which transmit and which does not retransmit and in which it has the loss probability of data periodically transmit. In the meantime, because of using the null packet in order to implement the transmission rate of the MPEG-2 transport stream in terms of the CBR (Constant Bit Rate), the transmission priority of this packet is most low among data.

62 As to the transfer period of PSI and PCR, while being determined to the fixed value in the MPEG -2 system specification, in order not to be defined in the ATSC data broadcasting transmission standard but it transmitted from the implemented example of data broadcast transmission system in which the present invention were applied to the transfer period of 1 second the transfer period of SDF set up. As to the transfer period of data carousel, a user defines and a user inputs the cycle to DST.

63 The transmission priority and transfer period of the transport stream packet can be set up as the embodiment and it differently can set up according to the significance of data and transmission rate with the system controller (25).

64 Fig. 4 is one preferred embodiment detail flow chart about the transport stream packet multiplexing procedure among data streaming method according to the present invention.

65 Firstly, the transport stream packet multiplexing process is respected to do and it is the MPEG -2 transport stream packet generated in data broadcast protocol encapsulation (23) at the buffer allocated according to data type of the multiplexer (24) with the storage (401).

66 As to the international data broadcasting standard, according to data type, because of defining the buffer model, in order to satisfy with the buffer model data streaming apparatus has to produce the MPEG-2 transport stream. For this, the multiplexer (24) the inspection (402) whether it is satisfied the buffer model in which the buffer model is defined in the international data broadcasting standard or not.

67 The number of MPEG -2 transport stream packets of data satisfying the buffer model of the storage (401), in the buffer which respects 0 rear side (403) transport stream packet multiplexing process to do and is the MPEG -2 transport stream packet generated in data broadcast protocol encapsulation (23) allocated according to data type of the multiplexer (24) and international data broadcasting standard the inspection (404) of the number of MPEG -2 transport stream packets of data satisfying the buffer model of the international data broadcasting standard does the transmission priority between the transport stream packets satisfying the buffer model it is not with 0 this (403).

68 It has the packet in which the transmission priority is high as the remultiplexer (16) or the program multiplexer (14) among transport stream packets satisfying the check result, and the buffer model with the electrical transmission (405).

69 The respective made MPEG -2 transport stream packet the MPEG -2 transport stream packet has to be transmitted according to the transmission priority in order to transmit the MPEG -2 transport stream packet satisfying buffer model with the remultiplexer (16) or the program multiplexer (14). It sets up in this preferred embodiment, in order to transmit with the transmission priority like [table 1].

70 The method of the present invention as described above is implemented as the program and the method of the present invention as described above can be stored in the recording medium (the cdrom, RAM, ROM, floppy disk, hard disk, the magnetooptical disc etc) as the form can read from a computer.

71 In the above, the present invention illustrated is not restricted by the above-described embodiment and the attached drawing, but it has to a person skilled in the art and it will be clear in the technical field in which the present invention belong to be possible in the range that does not do not depart from technical mapping of the present invention with many substitution, and the deformation and change lice.

▸ Effects of the Invention

72 The present invention as described above establishes data broadcast system providing supplementary data for being out of the preexistence broadcast service which unilaterally delivers the information to a viewer and serving the interactive broadcasting like the broadcasting of education, the quiz entertainment, game, advertisement, weather forecast, drinking

house information offering, news offer, home shopping, home banking.

73 Moreover, the present invention has the effect that the discussed different kinds international standard is satisfied through one apparatus. In that way the transport stream altogether satisfied data broadcasting service including ATSC and DVB etc. is produced. Each transfer protocol is satisfied about data of the different type defined in each data broadcasting standard.

Scope of Claims

Claim[1] :

74 The data streaming apparatus for the digital data broadcasting of data streaming apparatus for the digital data broadcasting comprising the clock treatment means which stores multimedia data according to the supplementary data transfer request through the external Interface for the supplementary data electrical transmission with the control signal of the system control means: system control means controlling data streaming process; it checks the transmission error of data inputted with the control signal of the supplementary data presentation means: system control means multiplexing the stored data as described above and transmitted from the supplementary data presentation means; it analyzes data; and it has the system clock or the PCR (Program Clock Reference) of data broadcast transmission system as an input and data broadcast protocol encapsulant means provides the base time with the control signal of the system control means and the multiplexer which multiplexes the transport stream packet inputted from data broadcast protocol encapsulant means with the control signal of data broadcast protocol encapsulant means: system control means encapsulating data inputted from the supplementary data analysing mean to the international standard transfer protocol with the control signal of the supplementary data analysing mean: system control means delivering the analysis consequence information and data and which delivers in consideration of the transmission priority and buffer model to one transport stream and outputted for a synchronization between the motive of data stream and a stream.

Claim[2] :

82 The data streaming apparatus for the digital data broadcasting of claim 1, wherein in the system control means, data are transmitted according to the transmission schedule table controlling the supplementary data presentation means and defines data to especially have to transmit with each time slot; the part watches when data being input from the supplementary data presentation means furnace whether data analysis means operates and or not it controls; it controls the transport stream output factor and output directivity of a multiplexer; it controls the extension program multiplexer in order to insert data sending stream packet which is input from a multiplexer into a video and audio transport stream; and it controls PSIP (Program And System Information Protocol for terrestrial broadcast and cable) / SI (Service Information) generator in order to use the PSIP table if data broadcast protocol encapsulant means use the ATSC data broadcasting transmission standard and it produces the SI table if it uses the DVB data broadcasting transmission standard and it transmits with the extension remultiplexer.

Claim[3] :

89 The data streaming apparatus for the digital data broadcasting of claim 1, wherein in the supplementary data presentation means, multimedia data is stored; and it has the database which all datas which can be used for data broadcasting service are stored or data which can be used for data broadcasting service are received from an outside and it stores.

Claim[4] :

92 The data streaming apparatus for the digital data broadcasting of claim 1, wherein data broadcast protocol encapsulant means uses the ATSC (Advanced Television Systems Committee) data broadcasting transmission standard from the system control means; the control signal which uses the DVB (Digital Video Broadcasting) data broadcasting transmission standard, determines is input and it sets up the corresponding protocol; it encapsulates data to the corresponding to data broadcast protocol by using the meta information which is input from the supplementary data analysing mean; it produces the PSI (Program Specific Information) table and data broadcasting table of service in which data broadcast service information and MPEG -2 system information are input from the system control means and including the PAT (Program Association Table).

and the PMT (Program Mapping Table); and it makes the encapsulated data as described above and generated table as described above the respective MPEG -2 transport stream packet and it transmits with a multiplexer.

Claim[5] :

98 The data streaming apparatus for the digital data broadcasting of claim 4, wherein synchronized asynchronous streaming data or bistrimming data encapsulates to DSM- CC (Digital Storage Media Command and Control) section of the international data broadcasting standard; the IP (Internet Protocol) datagram encapsulates the MAC (Multimedia Access Control) address to the private section which the process of encapsulating to data broadcast protocol includes; and streaming data synchronized with motive streaming data encapsulate to the MPEG-2 PES.

Claim[6] :

103 The data broadcast protocol encapsulant means as to claim 5.

105 The data streaming apparatus for the digital data broadcasting wherein the necessary null packet is produced to multiplex in order to produce the MPEG -2 transport stream packet by adhering the MPEG -2 transport stream packet header to the PES packet or each section data and. it is satisfied the CBR (Constant Bit Rate) and buffer model in a multiplexer.

Claim[7] :

106 The data streaming apparatus for the digital data broadcasting of claim 1, wherein a multiplexer selects one packet in consideration of the transmission priority and it transmits among data by types MPEG -2 transport stream packets satisfying the investigation result buffer model the MPEG -2 transport stream packet generated in data broadcast protocol encapsulant means is input according to data type.

Claim[8] :

109 The data streaming method for the digital data broadcasting of data streaming method for being applied to data streaming apparatus for the digital data broadcasting comprising the third step: which produces the transport stream packet it produces the service information table it encapsulates the first step: second step: multiplexed multimedia data as described above which decides data broadcasting transfer protocol it analyzes the multiplexed multimedia data as described above to the protocol determined on the second step multiplexes multimedia data which it transmits it receives the request to send and transmission schedule information of multimedia data according to the transmission rate a system is initialized and the fourth stage which multiplexes the generated transport stream packet as described above in consideration of the transmission priority and buffer model to one transport stream and outputted.

Claim[9] :

115 The data streaming method for the digital data broadcasting including the seventh step multiplexing data block divided according to the transmission rate allocated to the sixth step: which adds the meta information to data block divided in the fifth step, the fifth step dividing selected data into the block of the size defined within the transmission schedule information it selects data for to transmitting according to the transmission schedule information of multimedia data and each data defined within the transmission schedule information of claim 8, wherein in the first step, it is received if a system is initialized.

Claim[10] :

121 The data streaming method for the digital data broadcasting of claim 8 or 9, wherein the transmission schedule information includes data transfer rate about each data, data communications method, and the transmitted data name, data type, the module Identification, the block number, the block size, the PTS (Presentation Time Stamp), the PTS extension, the CRC

(cyclic redundancy check).

Claim[11] :

124 The data streaming method for the digital data broadcasting of claim 9, wherein the meta information includes data type, the module Identification, the block number, the block size, PTS, the PTS expansion (extension), CRC about each data.

Claim[12] :

127 The data streaming method for the digital data broadcasting analyzing multimedia data and includes the eighth step inspecting the loss whether or not of data, and the ninth step of claim 8 or 9, wherein is multiplexed above statement, and the ninth step requests a retransmiossion if it has the check result loss of the eighth step and decides data broadcasting transfer protocol if it does not have the loss.

Claim[13] :

131 The data streaming method for the digital data broadcasting including the tenth step stored in a buffer, the eleventh step inspecting the transmission priority between the transport stream packets satisfying the buffer model the buffer model contentment whether or not is inspected of the stored each transport stream packet as described above, and the twelveth step transmitting the transport stream packet of claim 12, wherein the fourth stage is the transport stream packet of each data allocated, and as to the twelveth step, the transmission priority is high according to the priority of the tenth step.

Claim[14] :

137 The computerlegiable medium which a system is initialized in data streaming apparatus equipped with a processor; and records the program for realizing the third function: of encapsulating the first function: second function: multiplexed multimedia data as described above of analyzing the multiplexed multimedia data as described above and deciding data broadcasting transfer protocol to the protocol determined with the second function and of multiplexing multimedia data which receives the request to send and transmission schedule information of multimedia data and which transmits according to the transmission rate producing the service information table and the transport stream packet and the fourth function of multiplexing the generated transport stream packet as described above in consideration of the transmission priority and buffer model to one transport stream and outputing.